

MASCULINITIES: A SCALE CHALLENGE IN IRRIGATION GOVERNANCE IN NEPAL¹

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NORMAL PROFESSIONALISM

Robert Chambers (1988) coined the term ‘normal professionalism’ at the end of the 1980s to criticize the ‘disciplinary culture’ of irrigation agencies and academia which guided the production of knowledge, and to argue that ‘epistemological’ issues were part of irrigation project failures. This paper builds further on his critical inquiry of ‘normal professionalism’ by addressing much neglected gender issues of professionalism in irrigation.

MEN’S PARTAKING IN IRRIGATION GOVERNANCE

This paper is inspired by long standing gender concerns in irrigation governance, i.e. the exclusion of women in irrigation decision making. However, rather than focusing on women, this paper is about *men’s partaking* in irrigation governance. Professional water governance bodies such as irrigation agencies, water NGOs, farmer - and water user associations, and water research institutions, tend to consist only of men and women’s absence and invisibility becomes even more prominent when moving to higher management levels. Irrigation powers, authorities and expertise are mostly vested in men, and successful performance as a water manager is strongly correlated with behavioural characteristics that are associated more with men than with women (Zwarteveen, 2008; Laurie, 2005; Lynch, 1993).

This gendered pattern of ‘manhood’ is considered ‘masculine’ in this paper. With the objective to continue addressing gender concerns meaningfully in irrigation, and to plea for a new (FMIS) research agenda, linkages between men, masculinities and power in irrigation governance need to be unpacked, questioned and scrutinized.

CONCEPTUALIZING MEN, MASCULINITIES AND POWER

The dominant gendered pattern of social practice in a society can be labeled as ‘masculine’ when men dominate these practices, for example, the practice of public politics (Connell, 2005). Irrigation governance (in Nepal) is no exception, and is a (structure of) social practice that is (historically) dominated by men.

The type of masculinity in irrigation governance that I consider problematic – as a ‘scale challenge’ – is hegemonic masculinity (Connell, 2005). Gramsci’s ‘hegemony’

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means ascendancy through culture, institutions, and persuasion. Hegemonic masculinity entails a gender hierarchy, a norm that implies the most honoured way of being a man, and a dominant pattern to which all men and women have to position themselves. This theory implies that (high-caste) male irrigation professionals intentionally nurture their 'masculinity' to secure control and power in irrigation governance, to the exclusion of women and other men (e.g. Madhesi, janajati etc.).

MASCULINITIES: A SCALE CHALLENGE IN IRRIGATION

This paper considers the 'masculinity' of irrigation governance as a 'scale challenge' for more democratic, and more sustainable and integrated ways of irrigation governance. Cash *et al.* (2006) define a 'scale challenge' as a situation in which the current combination of cross-scale and cross-level interactions threatens to undermine the resilience of a human-environment system. For example, an irrigation system is a human-environment system, and the practice of men dominating irrigation management at all 'scales', such as policy, planning and operation; and at all 'levels', from field to office level, undermines the resilience and sustainable use of irrigation systems.

In irrigation governance, the 'scale challenge' between actual field realities, and expectations and administrative realities is widely recognized. Many irrigation bureaucracies in developing countries, often with the support of funds and expertise from outside, have adopted policies and programs to bridge this gap, also in Nepal (Gautam, 2006; Shukla and Sharma, 1997). Recurring elements of these programs are decentralization and user participation, through different levels of users' representation in water users' associations (WUA).

In this model, WUAs form the formal link between government bureaucracies and irrigators or farmers, and as such the WUAs are important gatekeepers of flows of information and resources between two levels of governance. Yet, also at the level of farmer- and water user organizations there is a gendered pattern of 'manhood'. In Nepal, women participation in WUAs has produced mainly 'token representation' (Ghimire, 2004). Hence, these programs have been unable to change (significantly) the masculinity of irrigation governance, and the 'scale challenge' remains there³.

MAKING MEN VISIBLE IN IRRIGATION

As a way of making men visible in irrigation governance, this paper presents an analysis of irrigation history of Nepal based on literature review. The purpose is to show that irrigation governance, as a masculine gender practice of especially high caste men with a Parbatiya and Newar background, evolved and changed over time. The focus is particularly on the emergence of 'modern' irrigation and (hegemonic) masculinities of civil engineers, and how those has been challenged by the debate on Farmer Managed Irrigation Systems (FMIS), because FMIS research and its practitioners, unlike gender debates in the water sector, continue to pose a serious challenge to hegemonic patterns of irrigation governance in Nepal.

³ Membership criteria of WUAs, such as land ownership and timing of meetings, have also emerged as barriers for women's participation.

The analyses in this paper nevertheless suggest that irrigation governance, also in relation to FMIS, has become *more masculine*, and not necessarily more gender sensitive as generally is assumed by irrigation professionals and development practitioners. To counter this masculine trend in irrigation governance in Nepal, this paper produces a set of questions for further research, as a contribution to a new (FMIS) irrigation research agenda.

THE MASCULINE POLITICS OF IRRIGATION HISTORY

Writing irrigation history is a political act, and knowing that men dominate irrigation governance, thick with masculine politics. Scrutinizing irrigation history is thus a critical reflexive exercise for (male) irrigation professionals to appreciate gender concerns and to scrutinize one's own masculinity. Being a Wageningen educated water professional doing research on irrigation in Nepal. I consider myself partially an *insider*, a colleague of Nepali water professionals, who are now faced with assertive ethnic and marginalized minorities in Nepal's emerging democracy, but I am also a *bideshi* (foreigner), a visiting researcher to Nepal, who is part of the (post) colonial *bikas* industry and the 'paternalistic' social hierarchy that is produced by it⁴.

Analyzing the authors cited in this paper (see table 1), shows, in hindsight, that my writing of (gender) history has barely been 'inclusive', and still far from ideal.

TABLE 1: THE MASCULINE POLITICS OF CITING AUTHORS

<i>Bikas</i> hierarchy	No. of authors cited	Men	Women
Western men	21	21	
High caste Nepali men	13	13	
Western women	11		11
High caste Nepali women	7		7
Foreign Asian men	1	1	
Madhesi men	1	1	
Ethnic Nepali women	1		1
Total	55 (100%)	36 (65%)	19 (35%)

CONSTRUCTING AN IRRIGATION HISTORY OF NEPAL

Constructing an irrigation history, let alone a gendered irrigation history, is quite a challenge. This paper makes use of four categories of (literature) sources: (1) studies on land tenure and fiscal policies, (2) historical and anthropological studies on Hinduism, the caste system, and the development of Nepal as a Hindu kingdom, (3) irrigation (case) studies and gender research, and (4) documents containing numbers on irrigation in Nepal.

⁴ By breaking with the 'isolationist' policy of the Ranas, and 'opening up' to the rest of the world, the new Nepali leadership wanted to bring development. This phenomenon, called *bikas* in Nepal, was the connection between the nation-state and the rest of the world (Sharma, 2008)

(1) LAND TENURE AND TAXATION

Regmi (1977, 1972) and the many scholars who quote his work emphasize the predominant role of 'land' in Nepal's history, but fail to appreciate in the same way that 'water' played also a critical role in Nepal's development as a nation. Subsequently, irrigation has remained largely invisible in Nepal's history; incorrectly, because the land tenure system in Nepal, regulated by a feudal elite and landlords, had its roots in irrigation. The taxation classification for *khet* land in the 19th and early 20th century: *abal*, *doyam*, *sim*, *cahar* lands (see Regmi, 1977: 132), is a striking example that irrigated land was subject to heavy taxation and thus (strict) state control.

Given that higher tax was imposed on irrigated land, it suggests that water resources (and irrigation) were *de facto* controlled through land assignments and taxation (before 1951). Hence, once land was assigned by the king, and as long as tax obligations were fulfilled, water control for irrigation was considered by the rulers merely an affair of locality. This thus not mean though, as Benjamin and Shivakoti (2002) tend to argue, that this allowed for 'autonomous and non-political' governance of water resources for irrigation. On the contrary, through taxation and landlordism, irrigated land was the prime interest of state control. Only the revenue collected from the exploitation of *Terai* forests, which is estimated to have amounted 40% of the national income in the 19th century (Bajracharya, 1983), could potentially have matched revenue collected from (irrigated) agriculture⁵.

(2) HINDUISM AND THE KINGDOM OF NEPAL

Irrigation is linked with Hinduism in important ways. In Hindu culture, rice is considered a noble product, the favourite food of both (Hindu) deities and humans; rice is an element of social hierarchy, since one can not accept boiled rice prepared by a member of a lower caste, and rice emerged as a way of classifying the environment, e.g. land terminology in Nepal is based on the absence or presence of wet rice cultivation (Aubriot, 2004; Bennett, 1983). Tentatively, it can thus be argued that in many parts of Nepal, agricultural intensification (of rice) and irrigation emerged as part of processes of Hinduisation.

In addition, 'purity' in Hindu ideology is linked in various ways with water, and these linkages carry strong (symbolic) gender dimensions. For example, menstrual blood is a strong source of pollution, particularly to initiated males, and, when menstruating, women (of high) caste become thus polluted and untouchable. At such time, she must not enter the kitchen, touch food or water that others will eat or drink (Bennett, 1983). Hence, 'water' has functioned as an organizing principle in the Hindu caste system favouring high caste Brahman men, e.g. being 'impure' discouraged women's involvement in irrigation governance at village level, but also at higher levels which were controlled by high cast Brahmans, Chhetris and Newar men, who preserved purity.

⁵ Exploitation of forests, unlike irrigated rice land, may have provided more (and much needed) *monetary* income for the state (Regmi, 1977).

Mythic stories like *Machhendranath* in the Kathmandu valley typically feature men as main characters and associate ‘water’ with ‘men’ and ‘risks’ (of long and dangerous journeys), suggesting that water control had already strong masculine (Hindu) connotations at a symbolic level in early times (Gurung, 2002). Under the Shah and Rana rulers, Hinduism became the dominant ideology to legitimize state control (and taxation of irrigated lands) (Gellner *et al.*, 2008). Social codes, such as the *Dibya Upadesh* (divine council), the political statement dictated by king Prithvi Narayan Shah (c.1775), which envisioned the kingdom as a true Hindustan of four *varnas* (castes) and thirty-six *jāts* (tribes), and the *Muluki Ain*, the first civil code of Nepal (1854), which committing the state to the enforcement of a uniform caste-based moral order, increasingly narrowed down social relations of subjects, most of whom belonged to non-Hindu tribal communities (Whelpton, 2005)

It was the king’s responsibility (and the nobility surrounding the court) to protect the Hindu kingdom of Nepal from becoming ‘polluted’ by the rule of the Mughals (Muslims) and their British successors (in India) (Whelpton, 2005). In this context, the enforcement of ‘traditional’ Hindu regulations became a great concern for the rulers. It legitimated their power and military campaigns to preserve Nepal as a true Hindu kingdom. It also meant that high-caste (male) Hindus, who preserved purity and did not slaughter cows, were favoured for assignments of land (and water resources).

The social stratification which emerged after the ‘unification’ of Nepal, in processes of Hinduisation, thus, also embodied a significant gender and ethnic stratification in the country and in irrigation governance (cf. DFID/WB, 2006). As Hinduism became the norm for social relations in the whole country and state governance, it is save to assume that men and women of low cast and ethnic minorities, but also women of the (high) Parbatiya castes were further marginalized in society and in irrigation governance.

(3) IRRIGATION STUDIES

To improve design and management of (new) public irrigation systems, studies were conducted by Cornell university/ Ford foundation in the Philippines, Indonesia, Taiwan, Thailand, and *later* in Sri Lanka and Nepal as early as the 1960s. These studies revealed that irrigation behaviour of users was prescribed by rules, which were based on equity, but that the perception of what was equitable varied with circumstances, and that operational rules were often embodied in the physical infrastructure of the systems and in the tenure arrangements among the landowners (Levine, 1992; Coward, 1980). Hence, (FMIS) irrigation research was born.

Careful reading reveals that especially *underperformance* of public irrigation systems in the *Terai*, provided space for alternative (FMIS) irrigation thinking in Nepal, and secondary the *extension* of government services for FMIS rehabilitation. For example, the International Irrigation Management Institute (IIMI), which major focus was initially FMIS research, was established in 1984, only after *management problems* (of public irrigation systems) had been identified as the key to improving irrigation performance. Subsequently, the government picked up an interest to extent its services to FMIS rehabilitation. For example, an international seminar on public intervention in FMIS systems was organized in Nepal in 1987 (Pradhan, 2007).

FMIS research in Nepal in the 1980s and 1990s secured a firm place in global irrigation debates. First generation FMIS studies in Nepal in the 1980s were mainly concerned with understanding irrigation management in FMIS systems (Pradhan, 1989; Martin and Yoder, 1988; Howarth and Pant, 1987). Second generation FMIS studies in Nepal in the 1990s were more concerned with defining principles for management of common property resources for 'crafting irrigation institutions' (cf. Shivakoti and Ostrom, 2002; Lam, 2006; 1996). Both type of FMIS research eagerly show that FMIS 'work' in Nepal, but, and here I refer especially to second generation FMIS studies, with the objective to draw (universal) principles for better management, it tends to de-contextualize FMIS irrigation, and this has a number of consequences.

While seeing the value of strategic counter research against technocratic, centralist state planning, it regrettably has fed the fashionable, but incorrect idea that 'the fiercely independent mountain men and women of Nepal (...) have designed and operated their own irrigation systems for centuries' (Carsch *et al.*, 1992: 46). Such an understanding of irrigation history disguises the fact that irrigation institutions in Nepal emerged (and sometimes disappeared) in the context of specific geographical, socio-economic, and cultural-political circumstances. Hence, the idea of Nepali irrigation (institutions) since time immemorial presents irrigation and men's partaking in irrigation as normal, and is thus highly problematic from a gender perspective.

Parallel to FMIS research in Nepal to make *farmers* visible in irrigation, studies on gender in irrigation were conducted elsewhere to make *women* (farmers) visible in irrigation (Koppen, 1992). Soon home-grown gender studies on irrigation emerged in Nepal, which pointed out the overwhelming involvement of women in farming and irrigated agriculture (Ghimire, 2004; Upadhyay, 2004; Udas, 2002; Koppen *et al.*, 2001; Zwarteveen and Neupane, 1996). In this context, it is a puzzle to understand why gender issues did not prominently surface in FMIS research in the 1980s. Surely, irrigation scholars must have witnessed the overwhelming participation of women farmers in irrigated agriculture, yet, seemingly, it remained unnoticed in their work (Martin and Yoder, 1988; Pradhan, 1989). This can be no coincidence.

(4) NUMBERS ON IRRIGATION IN NEPAL

The collection of irrigation data answered closely to political interests of (male) civil engineers whose duty it was to construct canals since the 1950s as part of planned development. Analyzing numbers on irrigation (see table 2) can thus reveal how hegemonic masculinity, as a scale challenge, developed in irrigation governance. As per 2006, irrigation engineers' knowledge and practices dictated irrigation governance, while their 'stake' in the irrigation sector in Nepal was only 26%.

The neglect of FMIS irrigation in data collection was no coincidence or a matter of ignorance. The proceedings of the first conference on agriculture in Nepal in 1958 explicitly mentioned the importance of locally managed irrigation schemes, and emphasized the need to support existing irrigation systems (Dahal, 1997). Apparently, indigenous irrigation did not fit the *bikas* project of Nepal, and did not serve the interests of irrigation engineers.

TABLE 2: EVOLUTION OF IRRIGATION DATA IN NEPAL

Year	Total irrigated area (ha)	AMIS (ha)	FMIS (ha)		Ground water (ha)	Non-convent. (ha)
		<i>Terai</i>	<i>Terai</i>	Hills & Mnt.	<i>Terai</i>	<i>Terai, Hills & Mnt.</i>
1961	31.900	31.900	-	-	-	-
1970	117.500	117.500	-	-	-	-
1972	180.000	180.000	-	-	-	-
1980	267.000	267.000	-	-	-	-
1981	875.000	(s.1980)	458.000	150.000	-	-
1984	539.000	-	405.000	134.000	-	-
1988	958.000	350.000	(s.1981)	(s.1981)	-	-
1990	1.155.605	547.605	(s.1981)	(s.1981)	-	-
2006	1.227.353	314.521	416.184	205.479	278.158	13.011
Perc.:	100%	26%	34%	17%	22%	1%

Sources: Biswas, 1989; WECS, 1981; Land Resources Mapping, 1984, Irr. Master Plan, 1990, Eco. survey, 1987/1988; DBID, 2007

The numbers in table 2 are still thick with politics. The concepts ‘FMIS’ and ‘AMIS’, now taken for granted, have emerged in a specific historical period, namely in a situation of underperformance of publicly financed irrigation systems in the 1980s; and served a specific goal, namely to increase performance levels of AMIS systems. Technically, FMIS and AMIS may not match real situations anymore. For instance, how to categorize FMIS systems which received ‘agency-assistance’ for rehabilitation (333.427 ha according to DBID, 2007), or ‘turned-over’ AMIS systems as part of IMT policies?

Reviewing these data, in the absence of much evidence, Benjamin and Shivakoti (2002) are right to argue that it is difficult to conclude whether irrigation before 1950 was developed or not. However, their presentation of data of 109 (FMIS) systems from the National Irrigation Institutions Systems (NIIS) database, makes a rough estimation possible; 33 of them have their origin prior to 1900 and 13 of those operating before 1800 (see table 3). Given that irrigation construction (of FMIS) requires manual labour, it can tentatively be argued that there is a relation between population growth and irrigation development (cf. Aubriot, 2004). Up to the 1980s, population growth was still (more or less) correlated with (new) land settlement in the *Terai*⁶.

⁶ In this reasoning, I discard the construction of AMIS systems because it embodied a new mode of irrigation development which did not exist in the past; hence, making comparison meaningless.

TABLE 3: (FMIS) IRRIGATION DEVELOPMENT IN NEPAL

Year	Population	FMIS (sample no. NIIS database)	FMIS total in Nepal (ha)	Irrigated ha/p.
1800	3.100.000	(before 1800) 13	(comp. weight) 74.143	0,024
1911	5.638.749	(before 1900) 33	(comp. weight) 188.210	0,033
1930	5.532.574			
1954	8.256.625			
1971	11.555.983			
1991	18.491.097	(as per 1992) 109	(as per 2006) 621.663	0,034
2001	23.151.423			

Sources: Central Bureau of Statistics, 2003; Aubriot, 2004 (for pop. est. 1800); NIIS database (Shivakoti and Ostrom, 2002).

So, if an irrigated hectare per person can be taken as a measure for irrigation development, table 3 provides some evidence, albeit circumstantial, that (FMIS) irrigation was equally well developed around 1900 (0,033 ha/p) than in the 1990s (0,034 ha/p). The figures also suggest that there was a growth of (FMIS) irrigation somewhere in the 19th century, or early 20th century (cf. Aubriot, 2004). Presumably, land use arrangements before 1900 were too exploitative for tillers to engage into irrigation development without hesitations. This could explain why the number around 1800 (0,024 ha/p) was lower. Overall, these numbers calculate in an average irrigation growth in a period of nearly 200 years, of more than 1% per year. If that is so, it stresses the point that also irrigation, like land, was the bedrock of the Hindu kingdom under the Shah and Rana rulers.

SIX TRANSITIONS OF IRRIGATION DEVELOPMENT IN NEPAL

Irrigation development in Nepal can be categorized in six transitions⁷. Irrigation in each transition emerged in specific geographical and socio-cultural circumstances, but there is only space to present a rough outline. The objective is to engender irrigation history by showing that irrigation in Nepal since ‘time immemorial’ is a myth and that early irrigation development did not take place in an ‘autonomous and non-political’ context.

(1) FIRST IRRIGATION TRANSITION: STATE PATRONAGE

Before 1860, mainly in the hills (Kathmandu valley); total approximately 75.000 ha.
Example of irrigation system: *Raj kulo* in Palpa district (western hills of Nepal), 103 ha.; over 300 years old; initiated by Mani Makunda Sen, the first Sen Rajah of Palpa; constructed to support a temple (*guthi*) (Martin and Yoder, 1988).

Farm households in Nepal occupied land under *kipat* (communal) or *raikar* (statutory) land tenure (Regmi, 1977). Under Hindu dynasties, *kipat* land tenure was increasingly molded into state ownership (*raikar*) through royal charters, e.g. *guthi*, *birta*, *jagir*, etc. (Regmi, 1972). Cultivators on *raikar* land obtained land through reclamation or

⁷ Irrigation in the Kathmandu valley is presumably much older than elsewhere in Nepal, and may have undergone an earlier transition.

redistribution under the *raibandi* system, i.e. periodical rotation of (rice) lands based on the size of the family, hence, favouring big families with many men *and* many women, and were only allowed to obtain a share of the harvest. It was in this context that wet-rice cultivation (and irrigation) originally evolved.

In this transition, the promotion of irrigation as part of land reclamation, and settlement - and taxation policies, became key strategy of the expanding Gorkha state. For example, king Prithvi Narayan Shah directed 'in case there are houses on lands which can be converted into fields, these shall be shifted elsewhere; irrigation canals shall be constructed, and the field shall than be cultivated' (Regmi, 1972: 143). In this context, it is easy to misinterpret a directive of king Ram Shah of Gorkha (1606-1636) which stipulated that 'complaints regarding the use of water for irrigation should not be heard' (Regmi, 1972: 18). Hence, if irrigation was really insignificant, it would never have been mentioned in a directive in the first place⁸.

It is also grossly misleading to take state expenditure on irrigation as a measure for the significance of irrigation for the kingdom. For example, revenue records of Morang district in 1808 show that the amount sanctioned for irrigation facilities was only Rs. 1.000 of Rs. 96.159 (1%), and indeed can be considered negligible (Regmi, 1972). However, the state at that time, primarily used *jhara* (forced) labour to invest in irrigation.

The pressure on cultivators was enormous as the result of increasingly higher (land) rents, and eviction and enslavement (to creditors) were the reality of the day (Regmi, 1972). Farm households only held 'occupancy rights' based on actual cultivation, payment of rent and fulfilling *jhara* labour obligations. Generally, 'the strained relationship between peasants and landlords deterred the peasantry from taking independent steps to improve the pattern of resource use' (Bajracharya, 1983: 231). Nevertheless, farm households may have invested in irrigation: (a) to safeguard land and water rights through occupation (b) to reduce risks of crop failure for revenue payments and prevent eviction from the land, or (c) to secure a subsistence level of production. So, if farmers 'crafted irrigation institutions' (Shivakoti and Ostrom, 2002), then they did so under coercion and exploitative labour relations.

An exception was, perhaps, irrigation canals constructed under *guthi* land tenure, i.e. land endowments made by kings and the 'common people' for religious and charitable purposes (Regmi, 1977, 1972). Presumably, property rights were more secure for farm households, because, the state had a (religious-political) interest in the maintenance of *guthi* lands and cultivators were presumably keen to obtain some religious merit themselves and do their job well. Being a faithful Hindu may have inspired cultivators to invest in irrigation, and, not surprisingly some of the oldest irrigation systems are on *guthi* land (Shukla and Sharma, 1997; Pradan, 1989).

Irrigation in this transition emerged strongly gendered, particularly benefitting high-caste men with a Parbatiya and Newar background. First, land grants, like *birta* and

⁸ This edict did thus not provide for autonomous and non-political governance of irrigation as argued by Benjamin and Shivakoti (2002).

jagir, tended to be concentrated for the most part among Brahmans, Chhetris and other classes of Indo-Aryan origin to the exclusion of Mongoloid and autochthonous groups such as the Gurungs, Magars, Limbus and Tamangs (Regmi, 1977). This presumably informed lower levels of (irrigation) governance, e.g. land grantees must have been keen to earn religious merit (and political prestige) themselves, favouring (high-caste) Hindu cultivators for irrigated lands.

Male cultivators had more opportunities than female cultivators to claim a say in irrigation matters. Occupancy rights were based on cultivation, payment of rent and fulfilling *jhara* labour obligations. Both men and women in farm households could claim a say in irrigation affairs based on their participation in cultivation (which was institutionalized in the *raibandi* system). However, payment of rent and fulfilling *jhara* labour obligations was mainly a men's affair. For example, the entire 'male adult population [but no women], irrespective of class or community' was under the obligation of *jhara* labour (Regmi, 1972: 103). In addition, women had to overcome many cultural barriers (of Hinduism) for public involvement in irrigation governance.

Farmers and irrigators, regardless of their ethnic and religious background, had to legitimize their control over land and water resources in relation to Hinduism and a king. Tentatively, it can thus be argued, that irrigation governance in this transition co-evolved with hierarchical (Hindu) masculinities, favouring high-caste Hindu men, and marginalizing indigenous men and women in general. Irrigation had firmly become a men's affair.

(2) SECOND IRRIGATION TRANSITION: PRIVATE PROPERTY RIGHTS

Between 1860 and 1950, mainly in the hills, but also Terai; total approximately 130.000 ha. Examples of irrigation systems: (1) *Megha kulo* in Solma district (eastern hills of Nepal), 40 ha.; start in 1883; initiated by group of 52 farmers (Howarth and Pant, 1987); (2) *Thulo kulo* in Palpa district (western hills of Nepal), 42 ha.; start in 1928; initiated by two individuals soon followed by 25 households (Martin and Yoder, 1988).

Excessive exploitation of cultivators continued under the Ranas, but the revision of revenue settlements between 1854 and 1868, marked the gradual evolution of a private property rights regime on *raikar* land (Regmi, 1977). New records of cultivators were made (1861-1862) specifying the land they held and the total payments due thereon. Such registration was considered the ultimate evidence of land-holding rights. Those listed were in a comparative advantage; they had now the possibility to rent their land, hire sharecroppers, or mortgage or sell it, as long as the registered cultivator made the stipulated payments (Regmi, 1977).

Furthermore, the gradual transfer from the *adhiya* system (sharecropping) to the *kut* system (fixed rents), caused that the relation between productivity and tax was lost. In addition, *ijara*, an abusive revenue collection system was gradually substituted by *amanat*, a system which controlled exploitation of the peasants by landlords. These changes established opportunities for various ways of rent-receiving land holding.

‘Private property rights’⁹ had emerged on approximately 86% of the cultivated land around 1900¹⁰, and the prospect of returns on investment provided ample opportunities for cultivators to invest (voluntarily) in irrigation *and reap the benefits*, causing an unprecedented boom in irrigation development.

The registration of cultivators further benefitted men (and marginalized women), because the ‘registered cultivator’ was usually the head of the household. Furthermore, it was particularly high-caste male cultivators who emerged as petty landlords.

(3) THIRD IRRIGATION TRANSITION: MODERNIZING NEPAL

After 1923, particularly between 1960 and 1990, mainly in the Terai; total approximately 300.000 to 550.000 ha. Examples of irrigation systems: (1) Nepal West Gandak Irrigation Scheme in Nawalparasi district (western Terai); 8700 ha.; start in 1963; initiated by the government; (2) Khageri Irrigation System in Chitwan district (central Terai); 3900 ha.; start in 1961; initiated by the government (Khanal, 2003).

In 1923, the first public irrigation project, the Chandra canal, was build under supervision of British engineers in the Terai (Shukla and Sharma, 1997). Irrigation, as one of the first (successful) modernization projects, embodied a logical continuation of state efforts to control and modernize the country. After 1951, agricultural productivity and food production became the concept for irrigation development rather than securing political support, and irrigation became part of planned development in 1956 (Shukla and Sharma, 1997; Dahal, 1997).

New ideals of social progress, science and technology now informed irrigation governance rather than loyalty to the king and excessive taxation. Furthermore, irrigation became subject to large public investments, which were largely provided though foreign aid. This implied that Nepal’s *bikas* project in irrigation became subject to a wide range of donor and foreign interests, fundamentally changing the cultural-political landscape of irrigation governance in Nepal (cf. Sharma, 2008; Mihaly, 1965). In addition, a specifically trained cadre of civil engineers was entrusted with the construction and management of irrigation systems. New gender layers and (hegemonic) masculinities emerged in irrigation governance in this context.

- Irrigation (and gender) progress became imagined in a framework of *bikas*, prescribing, often implicitly, different development trajectories for men and women. Men and women became imagined as separate homogeneous groups with specific (irrigation) development needs.
- *Bikas* entailed new (international) hierarchical relations of those who know about progress and those who are beneficiaries (and are ignorant about modernization). Foreign experts introduced (Anglo-Saxon) American and (British) Indian ideas of progress, ‘patronizing’ Nepali professionals (Mihaly, 1965). On a national level, high-

⁹ It concerned here rights between individuals, as the state could still confiscate the land without compensation (Regmi, 1977; 1972)..

¹⁰ This figure is calculated by taking 1952 as a reference year (Regmi, 1977).

caste male engineers with a Parbatiya and Newar background emerged as those who know about irrigation, and Nepali men and women of different caste and ethnic background, emerged as those who were to be ‘sensitized’ about modernization, and hegemonic *bikas* hierarchies became associated with *bahunbad* (Gellner *et al.*, 2008).

- Irrigation professionalism emerged strongly *disciplined* and strongly *gendered* in the 1950s in Nepal. Most irrigation professionals were civil engineers. As per 2008, 84% of the positions in DOI remain occupied by civil engineers (DOI, 2008). Furthermore, civil engineers were mainly high-caste male with a Parbatiya and Newar background. However, and this is counter to the general trend of Brahman/Chhetri domination in governance (DFID/WB, 2006), Madhesis are also disproportionately overrepresented among DOI staff (40%), and janajatis are disproportionately overrepresented among top positions of DOI (43% of ‘gazetted I’ positions) (DOI, 2008).

In this transition, women lost critical grounds for participation in irrigation governance. Modern irrigation designs were typically based on the ‘household unit’, assuming that resources and labour were equally shared and mobilized within a family by the head of the household, i.e. men (Koppen, 1992). Through contact with engineers and extension staff of irrigation projects, heads of households (men) became the main beneficiaries of new irrigation developments (cf. Upadhyay, 2004). Furthermore, participation in irrigation projects offered attractive venues for men to obtain status and political gain in the *bikas* hierarchy of a new Nepal (Sharma, 2001).

(4) FOURTH IRRIGATION TRANSITION: MIGRATION AND SETTLEMENT

Between 1960 and 1990, mainly in the Terai; total approximately 400.000 ha. Examples of irrigation systems: (1) *Baise kulo* in Nawalpasari district (western Terai); 100 ha.; start in 1977; initiated by 15 households; (2) *Chipleti kulo* in Chitwan district (central Terai); 140 ha.; start in 1971; initiated by farm households (Ternstrom and Shukla, 2001).

The Land Act of 1957, defined a ‘registered *raikar* landholder’ as ‘landowner’ (Regmi, 1977), and by the 1963-1964 land reforms, there existed legal land rights on approximately 90% of cultivated land in Nepal. This had an impact on irrigation development in two different ways. Petty landlords and cultivators (in the hills) had now (even) more secure property rights and were freed from forced labour obligations, and this gave them better opportunities to invest in irrigation. On the other hand, inequalities in agriculture remained unchanged (or increased) and this fuelled a steady flow of hill migrants to the *Terai* who were now ‘free’ to go. On a massive scale, these hill migrants initiated irrigation development in the *Terai*¹¹.

Re-settlement programs in the *Terai* seriously took off after 1954 (Mihaly, 1965). Re-settlement was part of Nepal’s *bikas* project; it was believed that ‘the supposed heavy production deficit of the hill region could be alleviated by resettling a significant portion of the hill population in the sparsely settled *Terai*’ (Bajracharya, 1983: 230). Even

¹¹ This went (often) accompanied with dispossession processes of *Tharu* and *Darais* communities in the Terai (Gellner *et al.*, 2008).

though ‘traditional’ practices, such as land accumulation by politicians, took hold again, more land was brought under the plough by farm households, and they brought an area under irrigation which equaled (or was more than) the area brought under irrigation by planned development.

Generally, land reforms and resettlement programs were less beneficial for women than men, because women hardly obtained land rights in the process of land reforms and gender inequalities in land access remained featuring prominently in the agrarian structure of Nepal (cf. Regmi, 1977).

(5) FIFTH IRRIGATION TRANSITION: UNCONVENTIONAL IRRIGATION

After 1970, mainly after 1990, in the hills and the Terai; approximately 295.000 ha. Examples of irrigation systems: (1) Bhairahawa Lumbini Groundwater Irrigation Project in Rupandehi district (western Terai); 13.185 ha. (in 25 years); start in 1976; initiated by the government (Gautam, 2006); (2) Drip irrigation in Palpa district; appr. 0,01 ha/user; start in 1998; 779 users; initiated by International Development Enterprise (Upadhyay, 2004).

Even though, groundwater irrigation projects were initiated as early as 1976 (see example), the government recognized the underutilized potential of ground water irrigation in the *Terai* only early 1990s, and launched programs such as subsidized credit schemes to facilitate growth in groundwater irrigation (Gautam, 2006). Although slower than planned, by 2006, approximately 22% of irrigated area in Nepal was ground water irrigated (see table 2). The focus shifted also to unconventional irrigation, facilitated mainly by (international) NGOs, such as drip irrigation and treadle pumps to target the poorest farm households (Manandhar *et al.*, 2009).

Conventional ways of irrigation governance prevailed before the 1990s, i.e. working with male beneficiaries, but in the 1990s, more ‘demand-based participatory approaches’ were adopted (Gautam, 2006). Unconventional irrigation projects often targeted women farmers. Nevertheless, gender barriers remain to exist, as most project staff are male and mainly have contact with male beneficiaries (Upadhyay, 2004).

(6) SIXTH IRRIGATION TRANSITION: SUSTAINABILITY AND EQUITY

In the near future, in the hills and the Terai. New approaches: Holistic irrigation development with a focus on efficient, sustainable and equitable use of water; towards integrated and democratic irrigation governance.

This transition sees the end of ‘irrigation expansion’ which has been the common denominator of all previous transitions. All cultivable area in Nepal will be used, and the population will continue to grow, putting increasing pressure on water resources, water use patterns *and* irrigation institutions. Irrigation must be managed more efficiently, but also governed more integrated and democratically to deal with contestations and conflicts. Contemporary user participation and turn over policies can be viewed as cautious steps in this direction.

In the context of a growing feminization of rural labour (Upadhyay, 2004), hegemonic masculinities in irrigation governance emerges as a critical barrier, a scale challenge, for more inclusive ways of irrigation governance. The challenge is to counter the masculinisation of irrigation governance rather than contribute to male hegemony in irrigation development. Masculinities, if ever, than now, need to be transformed in positive gender practices to face the 21st century challenges in irrigation governance.

THE MASCULINISATION OF IRRIGATION GOVERNANCE

The lesson that can be learned from this analysis is that ‘men’ and ‘masculinities’ have controlled irrigation right from the beginning in Nepal, albeit in different ways. Isolated masculinities before 1750 became hierarchically organized in the caste system of the Hindu kingdom to legitimize excessive taxation, and exploitative land – and water use practices in irrigation governance. After 1923, particularly after 1951, the ‘distant’ hegemony of Hindu kingship was replaced by a ‘persuasive’ hegemony of *bikas* (and state involvement) in irrigation governance. Especially, hegemonic masculinities evolving with the emergence of a distinctively gendered cadre of (male) irrigation engineers entailed an unprecedented masculinisation of irrigation governance at almost all levels, manifesting itself as a ‘scale challenge’ in irrigation.

The masculinisation of irrigation governance went accompanied with the exclusion of women. As summarized in table 4, women lost many grounds in various irrigation transitions to claim a say in irrigation governance.

TABLE 4: WOMEN LOOSING GROUNDS FOR A SAY IN IRRIGATION

Grounds	Time frame	Men	Women
Land allocation (<i>raibandi</i>)	Before 1850	X	X
Cultivation of <i>khet</i>	19 th & 20 th century	X	X
Hinduisation	19 th & 20 th century	X	
Fulfilling <i>jhara</i> labour	19 th & 20 th century	X	
Payment of rent	19 th & 20 th century	X	
Registration of land rights	1861-62	X	
Land reforms and resettlement	1950s, 60s, 70s	X	
Male irrigation engineers	After 1923	X	
‘Household unit’ (head of household)	After 1951	X	
Participation in <i>bikas</i> projects	After 1951	X	

The large public irrigation systems in the Terai are evidence of the heydays and unquestioned authority of civil engineering in Nepal. As the guardians of *bikas*, the engineers’ knowledge, practice and masculinities were hardly contested. Hence, the bias of engineers towards large-scale projects had not only to do with their ‘disciplined education’ (Chambers, 1988), or rent-seeking (Ostrom, 2002), but also with hegemonic masculinities, i.e. to secure a top place for the Nepali male irrigation engineer in the *bikas* hierarchy. An obvious way of doing that is to continue doing what irrigation engineers have always done: Constructing canals and designing big projects.

Hence, in a masculinity perspective, the professional resilience of irrigation engineers as a group to social inclusion and gender progressive change is thus importantly about

being professional, being knowledgeable and the legitimacy to be a certain type of man associated with civil engineering in irrigation governance.

If that is so, how can hegemonic masculinities of irrigation engineers be challenged and transformed in positive gender practices to overcome the scale challenge for a new mode of irrigation governance? The FMIS and gender debates, which emerged in a context of underperformance of large-scale irrigation schemes, may yield some answers, because it also questioned those who practiced irrigation governance, i.e. irrigation engineers. Hence, the 'irrigation crisis' in public irrigation governance, was thus also a 'masculinity crisis' of irrigation engineers in the 1980s, and this is a useful starting point for analyzing the challenges of underperformance.

COMPARING DEBATES ON FMIS AND GENDER

FMIS and gender debates and their practitioners both challenged hegemonic masculinities of irrigation engineers and normal professionalism in irrigation governance, but, as I see it, the 'FMIS debate' has been more successful in doing so than the 'gender debate' in Nepal¹². The rest of this paper is devoted to understand this and to learn about circumstances under which hegemonic masculinities successfully can be challenged and 'negotiated'.

Comparison is based on the follow understanding of FMIS and gender research:

- FMIS and gender research in irrigation took place in a context of underperformance and failed irrigation projects, and identified the lack of respectively farmer and women participation as key problems.
- FMIS and gender research in irrigation was conducted simultaneously in the 1970s and 1980s, albeit in different countries, by respectively irrigation scholars and gender scholars (Pradhan, 1989; Koppen, 1992).
- FMIS and gender research both produced ground-breaking insights in failures of irrigation projects, based on legal anthropological approaches to make farmers/women visible in irrigation, e.g. property rights, hydraulic property, tenure relations, juridical aspects of irrigation infrastructure (Koppen, 1992; Coward, 1980).
- FMIS and gender research in irrigation was both based on diametrically opposed concepts of irrigation construction, rights and governance, embodying 'radical' knowledge, contesting engineers' knowledge on almost all fronts, e.g. state versus farmer control, 'sophisticated' versus 'simple' technology, etc.
- FMIS and gender research produced both clear policy prescriptions, i.e. user and women participation.

In spite of these similarities, the low impact of gender research in irrigation governance in the 1980s and 1990s, stands in shrill contrast with the compromises the FMIS debate achieved in the same decades. First, the concept FMIS gained gravity in mainstream irrigation governance, and it obtained a 'constituency' among irrigation engineers, unlike gender, which remained a low priority on the irrigation agenda. Second, FMIS

¹² Concerns about ecological damage and competing uses between sectors can be identified as a third area of concern in the 1980s, which eventually became the debate on 'integrated water resources management'.

knowledge was molded into new leading policy packages of user participation in the 1990s for irrigation reform in Nepal. In addition, in the 1980s, DOI had already extended its focus to FMIS rehabilitation.

In contrast, four decades of gender research in irrigation (so far) hardly challenged practices in irrigation governance. Even though agricultural mechanization in the fifth plan (1975-1980) was dropped, perhaps due to the governments' apprehension about the negative impact of mechanization on rural livelihoods (of women) (Upadhyay, 2004), and gender issues have been incorporated into irrigation policies since the 1990s, irrigation governance has remained as masculine as ever. For example, widely implemented quota for women in WUAs have only resulted in 'token representation' in Nepal (Ghimire, 2004), and barriers for meaningful women participation remain there (Zwarteveen, 2008).

WHY FMIS AND NOT GENDER?

The question here is why FMIS knowledge (and irrigation scholars) were 'embraced' with relatively little resistance by irrigation engineers in the 1980s, and gender knowledge (and gender scholars) 'excluded' from irrigation governance, while there was an enormous overlap in their understanding of irrigation, and both types of irrigation knowledge contested conventional irrigation knowledge and exposed normal professionalism and vested interests of irrigation engineers in various ways, if it was not for a crisis of masculinity?

Obviously, FMIS research was molded into a format, which legitimized the practice of irrigation scholars in irrigation governance, and challenged hegemonic masculinities of irrigation engineers *within ranges* that were considered acceptable to them (as a group). Apparently, this never happened with gender knowledge in irrigation, or put differently, gender knowledge was too much to swallow for irrigation engineers operating in a masculine *bikas* hierarchy, making it difficult for gender scholars to legitimize their practice in irrigation governance. Arguments are summarized below why this happened with 'FMIS' and not with 'gender'.

- FMIS research was practiced by irrigation scholars who were 'international' (western) *men* who held high positions in the masculine *bikas* hierarchy of Nepal. Hence, irrigation scholars and the FMIS research they produced, challenged the knowledge and practice of irrigation engineers, but not necessarily their place as 'male engineers' in Nepal's hegemonic *bikas* hierarchy. In contrast, gender scholars were mostly (western) *women*, who generally held lower positions in the *bikas* hierarchy, and produced gender knowledge, which was based on assumptions of 'patriarchy' and 'manhood', explicitly challenging hegemonic masculinities of irrigation engineers (and not only their practice and knowledge).
- Irrigation scholars were in a much better position than gender scholars to negotiate their masculinities with irrigation engineers. First, irrigation scholars, being men, allowed for a 'matching' of masculinities as men among men. This gave irrigation scholars a head start over gender scholars who struggled to get into 'old boys networks'. Second, irrigation scholars often worked closely with irrigation engineers in Nepal,

providing ample opportunities to iron out (professional) masculinities in irrigation governance. Irrigation scholars must have been well acquainted, consciously or unconsciously, with the 'technical' and 'socio-cultural' sensitivities for engineers of their work. In contrast, gender scholars became later active in Nepal in the 1990s.

- The close cooperation between irrigation scholars and irrigation engineers allowed to muscle 'radical' FMIS knowledge into new modes of irrigation governance in which hegemonic masculinities of irrigation engineers were 'accommodated'. In an historical perspective, FMIS research was recycled into a familiar mode of irrigation governance, i.e. a 'distant' government 'assisting' farmers when deemed necessary (see first and second irrigation transition). In contrast, gender research in irrigation, implicitly and explicitly, addressed deeper structures of inequality and exclusion in society, which had emerged in a long historical context. Therefore, it was difficult for irrigation engineers (and gender scholars), the majority being part of privileged groups in society, to pour gender knowledge into a format which did not radically challenge their knowledge, practices and hegemonic masculinities in irrigation governance.

- In sum, FMIS research, recycled into a familiar governance mode, made possible by cooperation with male irrigation scholars, offered a welcome way out of the engineers' masculinity crisis in public irrigation governance and allowed them to hold power. The FMIS debate even provided a promising space, through FMIS rehabilitation, to strengthen professional interests of engineers and safeguard masculine practices in irrigation governance. Home-grown FMIS research also added international prestige to Nepal's irrigation sector.

The paradoxical lesson learned here is that to 'successfully' challenge hegemonic masculinity in irrigation governance, men and masculinities must be 'accommodated' during transformation processes. Putting it differently, as long as men and masculinities in irrigation governance are not explicitly addressed and 'negotiated', transformations to a more inclusive governance mode in irrigation will have (very) limited scope. Seeing the FMIS debate as a successfully negotiated settlement, it is worth to reflect, in retrospect, how successful the FMIS debate actually was from a gender perspective.

THE FMIS DEBATE: A NEGOTIATED SETTLEMENT

Two 'compromises' in FMIS research can be identified which remain problematic from a gender perspective.

First, FMIS research, especially second generation research, tends to *de-contextualize* FMIS irrigation to obtain principles for better management, but, in doing so, men and women farmers from different castes and ethnic backgrounds are made invisible. For instance, Shukla, Shivakoti, Benjamin and Ostrom (2002) argue that FMIS have to be recognized as 'legal entities' with full rights. FMIS are then subject to state water rule and hegemonic irrigation governance. From an historical perspective, state water rule and (local) FMIS water rights (and authorities) are based on diametrically opposed conceptions of the source of rights to use water. Registration of FMIS as a legal entities thus fundamentally challenges the socio-political fabric of FMIS irrigation control, i.e.

the state and not men and women farmers in different areas in Nepal will then be the highest authority.

Second, the invisibility of gender in FMIS research has arguably been the most worrisome compromise in the FMIS debate. Why did irrigation scholars not see (or write) about the overwhelming participation of women farmers in irrigated agriculture (Martin and Yoder, 1988; Pradhan, 1989; Shivakoti and Ostrom, 2002)? Most FMIS research discussed 'irrigation' in its narrow meaning, rather than speaking of 'irrigated agriculture' which would have allowed for gender analysis. From a masculinity perspective, as argued above, this is no coincidence.

In spite of these compromises, the FMIS debated fundamentally challenged normal professionalism and hegemonic masculinities in irrigation governance, through concepts such as 'social capital' and defining new governing principles, and therefore praise to FMIS scholars. User participation and turn over policies, and also the establishment of a National Federation of Water User Associations in Nepal (NFIWUAN) can be viewed as a direct outcome of the FMIS debate. At least, this created space for male, and some female farmers, throughout Nepal to re-partake in irrigation governance. This would never have happened if masculinities of civil engineers in irrigation governance were not challenged by FMIS research and irrigation scholars in the 1980s and 1990s.

CONCLUSIONS: A NEW RESEARCH AGENDA

The conclusions summarize 8 research questions for a new (FMIS) research agenda on gender in Nepal:

1. How do numbers on irrigation correlate with specific professional interests, of which men, how is that linked to hegemonic masculinities in irrigation governance?
2. In what ways is 'expansionist' irrigation, the common denominator in 5 irrigation transitions, linked to men and masculinities in irrigation governance?
3. Who were foreign (irrigation) experts in the 1950s and 1960s; what men, and how did their masculinity became linked to new ideals of progress, and how did that simultaneously 'e-masculinize' Nepali irrigation engineers in the 'paternalistic' *bikas* hierarchy?
4. How was irrigation governance at village and district levels, characterized by a plethora of cultures, masculinized by irrigation engineers (and scholars) under the cultural unity model of the *panchayat* government?
5. Why has gender remained invisible in mainstream FMIS research, while women actively participate in irrigated agriculture? How is that linked to men and masculinities in irrigation governance?
6. Who are the Madhesi and janajati men in DOI, and how did they negotiate their masculinity in irrigation?
7. Knowing that contemporary *bahunbad* emerged in an international context of *bikas*, and that Brahmins have been at the forefront of all political change and in adopting emancipatory political values in recent decades (Gellner *et al.*, 2008), how is *bahunbad* linked to notions of hegemonic masculinity in irrigation governance?

8. Knowing that irrigation engineering emerged with 'aid bureaucracies' in the 1950s in Nepal (Whelpton, 2005), and that the engineering tradition in India originates from the 1830s, how different are Nepali masculinities in comparison with, for example, Indian masculinities in irrigation governance?

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